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| 10/027,558      | 10/22/2001  | Rebecca W. Yuan      | WIDC-023/00US       | 9987             |

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| EXAMINER |
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FAN, CHIEH M

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| ART UNIT | PAPER NUMBER |
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2638

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/027,558

Applicant(s)

YUAN ET AL.

Examiner

Chieh M. Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17 is/are allowed.
- 6) ☒ Claim(s) 6-13, 19-27 is/are rejected.
- 7) ☒ Claim(s) 1-5, 14-16 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 32, 320, 323, 33, 330, 333 (see paragraph 0026, line 4), B320, B330, B321, B331 (see paragraph 0027, lines 4-5). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informalities:
- a. In paragraph 0004, line 3, "but synchronization" should be --- bit synchronization ---; and in line 10, the applicants need fill the blank.

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- b. In paragraph 0022, paragraph 0022 is incomplete.
- c. In paragraph 0024, line 3, "a correlation module 165" should be changed to --- a correlation module 160 ---.
- d. In paragraph 0025, the applicants are asked to check whether " $n + 34$ " in lines 7 and 8 should be ---  $n + 3$  ---.
- e. In paragraph 0035, " $n = 2$ " in line 9 should be changed to ---  $n + 2$  ---; and the applicants are asked to check whether " $n + 43$ " in lines 5 and 6 should be ---  $n + 4$  ---.

Appropriate correction is required.

### ***Claim Objections***

3. Claims 1-5, 14-16 and 18 are objected to because of the following informalities:

Regarding claim 1, "first plurality" in line 10 and in line 13 should be changed to --  
- the received first plurality ---.

Regarding claim 3, "third plurality" in line 5 and in lines 9-10 should be changed to --- the received third plurality ---; "a threshold" in line 7 should be changed to --- the threshold ---; "first plurality" in line 8 should be changed to --- the received first plurality -  
--.

Regarding claim 14, "first plurality" in line 10 and in line 13 should be changed to  
--- the received first plurality ---.

Regarding claim 15, "signal peak" in line 4 should be changed to --- symbol peak ---.

Regarding claim 16, "the at least an indication of the adjusted third plurality" in line 5 should be changed to --- the adjusted at least an indication of the received third plurality ---; "a threshold" in line 7 should be changed to --- the threshold ---; "first plurality" in line 8 should be changed to --- the received first plurality ---; "the third plurality" in line 9-10 should be changed to --- the received third plurality ---.

Regarding claim 18, "an offset tracking device" in the last line should be changed to --- the offset tracking device ---.

Appropriate correction is required.

4. Claim 27 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 24. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 23, 24 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Dutkiewicz et al. (U.S. Patent No. 5,629,960, hereinafter "Dutkiewicz").

Regarding claim 23, Dutkiewicz teaches an apparatus comprising: a receiver module (20 in Fig. 3), an A/D converter (21 in Fig. 3) connected to the receiver module, an estimation module (25 in Fig. 3) connected to the A/D converter.

Regarding claims 24 and 27, Hsieh further teaches a DC tracker (23 in Fig. 3) connected to the estimation module.

7. Claims 6, 7, 9, 10, and 19-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Hsieh et al. (U.S. Patent No. 6,643,336, hereinafter "Hsieh").

Regarding claim 6, Hsieh teaches electronic device comprising: a receiver (32 in Fig. 1) configured to receive a data signal; an analog-to-digital converter (34 in Fig. 1 or Fig. 3) coupled to the receiver, the analog-to-digital converter configured to generate a digital representation of the received data signal; a logic unit coupled to the analog-to-digital converter, the logic unit (56, 60 in Fig. 3, col. 7, lines 4-10) configured to compute an average DC value  $DC_{AVG\_}$  for the digital representation of the received data signal; a compensation unit (62 in Fig. 3) coupled to the logic unit; and a synchronization word

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storage device ( $C_0$ ,  $C_1$ ,  $C_2$ ,  $C_3$  in Fig. 5, note that  $C_0$ - $C_3$  are inherently stored in a storage device similar to the registers 67-75 that store  $C_1$ - $C_M$  in Fig. 4) coupled to the compensation unit, the synchronization word storage device configured to store a synchronization word; wherein the compensation unit is configured to compute a compensated average DC value  $DC_{AVG\_COMP}$  using the  $DC_{AVG\_}$  and at least a portion of the synchronization word stored in the synchronization word storage device (element 62 in Fig. 3 receives output from element 56 and element 60, which uses the output of correlator 54, which in turn uses the stored  $C_0$ - $C_3$ ); whereby the  $DC_{AVG\_COMP}$  is usable to compensate for a DC offset included in the digital representation of the received data signal (col. 6, lines 35-48).

Regarding claim 7, the receiver comprises a RF receiver (col. 3, lines 26-27, that is the receiver receives a RF signal).

Regarding claim 9, Hsieh further teaches that the DC offset estimator comprises: a correlation module (54 in Fig. 3) configured to correlate at least a portion of the digital representation of the received pilot signal with at least a portion of the known synchronization word; whereby a frame detection can be declared (58 in Fig. 3, note that 58 is an "edge" detector, which detects the edge of a frame).

Regarding claim 10, Hsieh teaches that the DC offset estimator further comprises: a peak detector (58 in Fig. 3) coupled with the correlation module, the peak detector configured to identify a symbol peak included in the digital representation of the received pilot wherein the symbol peak can be used by the correlation module to

determine symbol timing (element 58 outputs a trigger signal once a peak is detected, see col. 6, line 3-5).

Regarding claim 19, Hsieh teaches an apparatus comprising:

an analog-to-digital converter (34 in Fig. 3) configured to generate a digital representation of a received pilot signal, wherein the received pilot signal comprises an incoming synchronization word (12 or 16 in Fig. 2);

a DC offset estimator (38 in Fig. 3) coupled to the analog-to-digital converter; and a synchronization word storage device coupled to the DC offset estimator, and

a synchronization word storage device ( $C_0$ ,  $C_1$ ,  $C_2$ ,  $C_3$  in Fig. 5, note that  $C_0$ - $C_3$  are inherently stored in a storage device similar to the registers 67-75 that store  $C_1$ - $C_M$  in Fig. 4) configured to store a known synchronization word;

wherein the DC offset estimator is configured to compute an estimated DC offset using at least a portion of the synchronization word from the storage device and at least a portion of the digital representation of the received pilot signal generated by the analog-to-digital converter (the DC offset is estimated based on the output of the correlator (54 in Fig. 3), which correlates the received preamble with the local stored known preamble).

Regarding claim 20, Hsieh further teaches that the DC offset estimator comprises: a correlation module (54 in Fig. 3) configured to correlate at least a portion of the digital representation of the received pilot signal with at least a portion of the known synchronization word; whereby a frame detection can be declared (58 in Fig. 3, note that 58 is an "edge" detector, which detects the edge of a frame).



Regarding claim 21, Hsieh teaches that the DC offset estimator further comprises: a peak detector (58 in Fig. 3) coupled with the correlation module, the peak detector configured to identify a symbol peak included in the digital representation of the received pilot wherein the symbol peak can be used by the correlation module to determine symbol timing (element 58 outputs a trigger signal once a peak is detected, see col. 6, line 3-5).

Regarding claim 22, the DC offset estimator comprises: a logic unit configured to compute an average DC value  $DC_{AVG\_}$  (56, 60 in Fig. 3; col. 7, lines 4-10) for the digital representation of the received pilot signal; and a compensation unit (62 in Fig. 3; col. 6, lines 35-41) coupled to the logic unit; wherein the compensation unit is configured to compute a compensated average DC value  $DC_{AVG\_COMP}$  using the  $DC_{AVG\_}$  and at least a portion of the known synchronization word stored in the synchronization word storage device (element 62 in Fig. 3 receives output from element 56 and element 60, which uses the output of correlator 54, which in turn uses the stored  $C_0$ - $C_3$ ).

Regarding claim 23, Hsieh teaches an apparatus comprising: a receiver module (32 in Fig. 1), an A/D converter (34 in Fig. 1 or Fig. 3) connected to the receiver module, an estimation module (54, 56, 58, 60 in Fig. 3) connected to the A/D converter.

Regarding claims 24 and 27, Hsieh further teaches a DC tracker (62, 64, 42 in Fig. 3; col. 7, lines 4-14, col. 8, lines 41-45).

Regarding claim 25, Hsieh teaches that the estimation module comprises a DC offset estimation module (56, 60 in Fig. 3) and a frame detector module (54, 58 in Fig. 3).

Regarding claim 26, Hsieh further teaches a bit synchronizer (38 in Fig. 3).

8. Claims 23-25 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang (U.S. Patent No. 6,697,098).

Regarding claim 23, Wang teaches an apparatus comprising: a receiver module (14, 16 in Fig. 1), an A/D converter (19 in Fig. 1) connected to the receiver module, an estimation module (24 in Fig. 1 and 622 in Fig. 6; col. 6, lines 56-57) connected to the A/D converter.

Regarding claims 24 and 27, Wang further teaches a DC tracker (624, 626, 616 in Fig. 6; col. 6, lines 40) connected to the estimation module.

Regarding claim 25, Wang teaches that the estimation module comprises a DC offset estimation module (622 in Fig. 6) and a frame detector module (24 in Fig. 1 and Fig. 4).

9. Claims 23-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Schetelig et al. (U.S. 2003/0076905, "Schetelig" hereinafter).

Regarding claim 23, Schetelig teaches an apparatus comprising: a receiver module (9-12 in Fig. 1), an A/D converter (13 in Fig. 1, 16 in Fig. 3, paragraph 0037) connected to the receiver module, an estimation module (17 in Fig. 3 and first part of 19 in Fig. 3; paragraph 0042, lines 1-4) connected to the A/D converter.

Regarding claims 24 and 27, Schetelig further teaches a DC tracker (second part of 19 in Fig. 3; paragraph 0042, lines 4-7) connected to the estimation module.

Regarding claim 25, Schetelig teaches that the estimation module comprises a DC offset estimation module (first part of 19 in Fig. 3; paragraph 0042, lines 1-4) and a frame detector module (17 in Fig. 3; paragraph 0039, lines 1-2).

Regarding claim 26, Schetelig further teaches a bit synchronizer (18 in Fig. 3; paragraph 0022, lines 1-5; paragraph 0041).

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh et al. (U.S. Patent No. 6,643,336, hereinafter "Hsieh") in view of Nafie et al. (U.S. Patent No. 6,714,774, "Nafie" hereinafter).

Hsieh teaches the claimed subject matter including a conventional Bluetooth receiver front end (col. 1, line 23 and col. 3, lines 45-48), but does not specifically teach an IF stage. It is well known in the art that a direct conversion receiver (convert RF directly to baseband) has the disadvantage that unwanted DC offset may appear at the output of the mixer together with the desired baseband signal. An intermediate frequency stage is thus desirable. Nafie teaches a conventional Bluetooth receivers

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comprises an IF stage (col. 2, lines 57-62). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that receiver front end of Hsieh also comprise an IF stage to avoid undesirable noise.

12. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh et al. (U.S. Patent No. 6,643,336, hereinafter "Hsieh") in view of Dvorak (U.S. Patent No. 6,760,705).

Hsieh teaches the claimed subject matter including a Bluetooth device (col. 1, line 23), but does not specifically teach that the device may be a cell phone, personal digital assistant or a peripheral device. Dvorak teaches a Bluetooth device may be cell phone, personal digital assistant or a peripheral device (such as a printer) (col. 1, lines 12-21), such that a device may seamlessly connect with other devices through a radio frequency link. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the device of Hsieh in a cell phone, personal digital assistant or a peripheral device, so as to connect the device seamlessly with other devices through a radio frequency link.

***Allowable Subject Matter***

13. Claims 1-5, 14-16 and 18 would be allowable if rewritten to overcome the claim objections above. Claim 17 is allowed.

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14. The following is a statement of reasons for the indication of allowable subject matter:

Claims 1-5 and 14-16 are allowable because the prior art of record does not teach "comparing the adjusted at least an indication of first plurality of bits with corresponding bits of the known pilot signal; and responsive to a threshold number of bits of the adjusted at least an indication of first plurality of bits matching the corresponding bits of the known pilot signal, outputting the compensated DC average for the first plurality of bits." Claims 17 and 18 are allowable because the prior art of record does not teach "determining whether a threshold number of bits of the first portion of the received synchronization word as adjusted by the DC compensation factor match corresponding bits in the known synchronization word; and. responsive to a threshold number of bits of the first portion of the received synchronization word as adjusted by the DC compensation factor matching the corresponding bits in the known synchronization word, providing the compensated DC average to an offset tracking device."


### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Simmons et al. (U.S. Patent No. 6,654,593).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M. Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chieh M Fan  
Primary Examiner  
Art Unit 2638

September 2, 2005